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ASTRÆA.

Liverpool. Equatoreal. (Mr. Hartnup.)

1851.	Greenwich M.T. h m s	R.A. h m s	N.P.D. ° ′ ″	Compᵈ—Obsᵈ. R.A. s	Compᵈ—Obsᵈ. N.P.D. ″
May 12	9 59 9·1	14 23 30·57	95 0 42·4	+5·29	+24·0
	10 24 4·5	29·74	38·9	5·31	24·3
	10 48 59·9	28·90	35·2	5·33	25·0
	11 13 55·4	28·17	31·8	5·23	25·3
13	10 32 20·2	14 22 42·79	94 57 44·4	5·35	26·5
	10 52 16·4	42·23	41·9	5·27	26·7
	11 12 12·6	41·43	39·9	+5·43	+26·4

The parallax and computed places were deduced from the ephemeris contained in the Supplement to the *Nautical Almanac*, 1854.

The star of comparison for all the observations was *μ Virginis*.

The following is the assumed *mean* place for 1851·0 derived from the Greenwich Observations:—

	R.A. h m s	N.P.D. ° ′ ″
μ Virginis	14 35 12·80	95 0 26·05

METIS.

Durham. Fraunhofer Equatoreal. (Mr. R. C. Carrington.)

Set.	1850.	Green. M.T. h m s	App. R.A. h m s	Exc. of Ephem. s	App. N.P.D. ° ′ ″	Exc. of Ephem. ″	No. of Com. in R.A.	No. of Com. in N.P.D.
1	Dec. 23	15 36 58·2	10 2 50·44	...	70 35 18·9	...	18	6
2	27	14 27 30·6	3 17·25	...	70 19 51·3	...	24	8
	1851.							
3	Jan. 6	13 29 15·9	1 58·08	...	69 29 7·3	...	12	4
4	7	14 38 16·9	10 1 37·80	...	69 22 53·5	...	18	6
5	Feb. 8	10 50 11·1	9 36 37·13	−3·48	65 49 21·8	+6·4	18	8
6		12 28 50·6	32·76	3·42	...	...	meridian	
7	14	13 23 5·1	30 16·16	3·44	65 17 28·4	5·5	24	8
8	16	14 50 39·5	28 10·50	3·03	65 8 15·3	8·6	21	7
9	17	10 45 36·5	27 20·83	3·01	65 4 51·8	5·3	24	8
10	17	11 44 14·8	27 18·68	3·28	65 4 35·4	11·8	meridian	
11	20	13 31 7·6	24 19·70	3·14	64 53 10·3	8·9	24	8
12	21	12 54 37·3	23 25·03	3·34	64 49 57·3	9·2	16	8
13	23	12 47 50·8	21 36·23	−3·26	64 44 7·1	+4·4	11	4
14	Mar. 4	9 11 30·1	14 41·24	...	64 28 30·3	...	14	5
15	10	12 19 29·3	9 11 11·42	...	64 27 38·2	...	24	8

1850, Dec. 27. Wind loud, and sky unsettled.
1851, Jan. 6. Fog prevented further comparisons. *γ′*, the brighter star of *γ Leonis* was used.
Feb. 8. Set 5. R.A. and N.P.D. measures taken separately.
Set 6. Observed with difficulty on the meridian.
Feb. 17. Set 9. Measures very satisfactory, but star indifferent.
Set 10. Meridian. N.P.D. probably indifferent.
Feb. 23. Star in a difficult position. Interrupted by fog.

The above observations are corrected for refraction and parallax, and compared with the ephemeris circulated by Lieutenant Stratford, so far as that ephemeris extends.

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Mean Places of the Stars of Comparison used at Durham, and of certain other stars near the path of *Metis*, during the opposition of 1850–1, observed on the meridian at Durham: *—

Set.	Name.	Mag.	R.A. (1851·0). h m s	N.P.D. ° ′ ″	No. of Obs.
	(*a*)	8	9 4 53·57	65 5 48·2	1
14, 15	Lalande 18184	6	5 46·60	64 22 27·9	3
	Lalande 18259	9	8 5·83	64 44 40·4	3
	Lalande 18482	8	15 43·66	65 47 4·8	1
	(*b*)	9	16 36·45	64 37 39·6	3
13	(*c*)	8	21 30·35	64 40 15·8	3
11, 12	(*d*)	9	22 55·32	64 55 56·5	2
9	(*e*)	10	28 9·88	65 2 6·4	†
	(*f*)	8	29 2·60	64 56 11·9	3
7, 8	(*g*)	9	29 24·70	65 15 59·4	2
5	B.A.C. 3327	7	36 47·17	65 50 32·8	2
	Lalande 19329	8	44 27·84	66 40 56·1	5
	Lalande 19522	7	51 9·92	67 58 10·0	4
	B.A.C. 3423	7	54 30·00	67 20 1·9	1
4	Lalande 19677	9	9 56 55·60	69 21 50·7	2
2	(*h*)	9	10 0 3·24	70 30 30·5	2
1	B.A.C. 3460	7	0 57·40	70 44 21·4	2
	Lalande 19900	9	6 58·83	70 8 16·8	1
3	γ′ Leonis	2	10 11 45·05	69 24 25·4	4

BIELA'S COMET.

Extract of a Letter from Professor Santini of Padua to the Astronomer Royal.

"1851, *April* 3.

"Some time ago, I took the liberty of sending you the elements of the periodic comet of Biela for 1852, in which I had included the effect of the perturbations depending on *Jupiter* and *Saturn*. I have subsequently calculated the alterations depending on the earth and *Venus;* I have not, however, thought it necessary to take notice of those produced by *Mars*, both on account of the smallness of its mass, and because, during the revolution from 1846 to 1852, it is always at a great distance from the comet. The values of the alterations produced by *Jupiter*, *Saturn*, the earth, and *Venus* (ac-

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* "Star (*a*) was kindly observed for me at Cambridge by Mr. Breen.

† "The place of Star (*e*) depends on a single comparison with (*f*); it was too faint for the transit. The other stars were observed during February last, and would have been based on more observations had I not been suddenly suspended from work by illness. The corrections to *Nautical Almanac* stars, at present in use at Greenwich, were applied throughout in finding clock-error.

"I should state, in reference to the star-observations, that I find the average error of a single observation of a *Nautical Almanac* star, with the Durham transit-circle, to be in R.A. $\pm 0^{s}{\cdot}05$, and in N.P.D. $\pm 1''{\cdot}0$, the circle being small. The N.P.D.s are obtained differentially from *Nautical Almanac* stars, the *zero* of the circle being too unstable for independent measures of *zenith* distance."

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